MAPLE BLADDERGALL MITES

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The upper surface of maple leaves, especially those of silver and red maples, is frequently covered with galls – wartlike growths caused by mites. The galls, in which microscopic mites live and feed, are green when newly formed but gradually turn red and finally blacken. If numerous, they can result in deformed leaves and, consequently, mar the overall appearance of the tree.

THE GALLS

Plant galls are usually caused either by mites or insects. How they are caused is a matter that has attracted the attention of scientists for many years. The formation of plant galls appears to be linked to the secretion by mites or insects of plant-growth substances or enzymes that cause abnormal growth. Each species of gall-causing mite or insect is thought to produce its own type of growth substance which has a specific effect on plant growth. A plant attacked by mites of more than one species, therefore, has a variety of galls with sizes and shapes characteristic for each species of mite.

Research in gall formation has proved to be difficult. Although injections of crude extracts of insects and insect parts into healthy plant tissue have produced some galls, no specific chemical growth regulator has yet been isolated.

THE MITES

Several species of eriophyoid mites cause galls on maple leaves. The most common species in eastern North America is *Vasates quadripedes* (Shimer), the bladder gall mite of silver and red maples. Members of another species, *Vasates aceris-crumena* (Riley) cause finger galls on silver maple. Females of these two species induce gall formation on the new foliage in early spring. Each female becomes enclosed by gall tissue, and the resulting pouch provides a protected environment which is utilized by the mite as a brood chamber. By early summer, each gall may contain as many as several hundred needing mites, all linear descendants of the founding female. As the foliage begins to dry in mid-summer, specialized females are produced. These females migrate from

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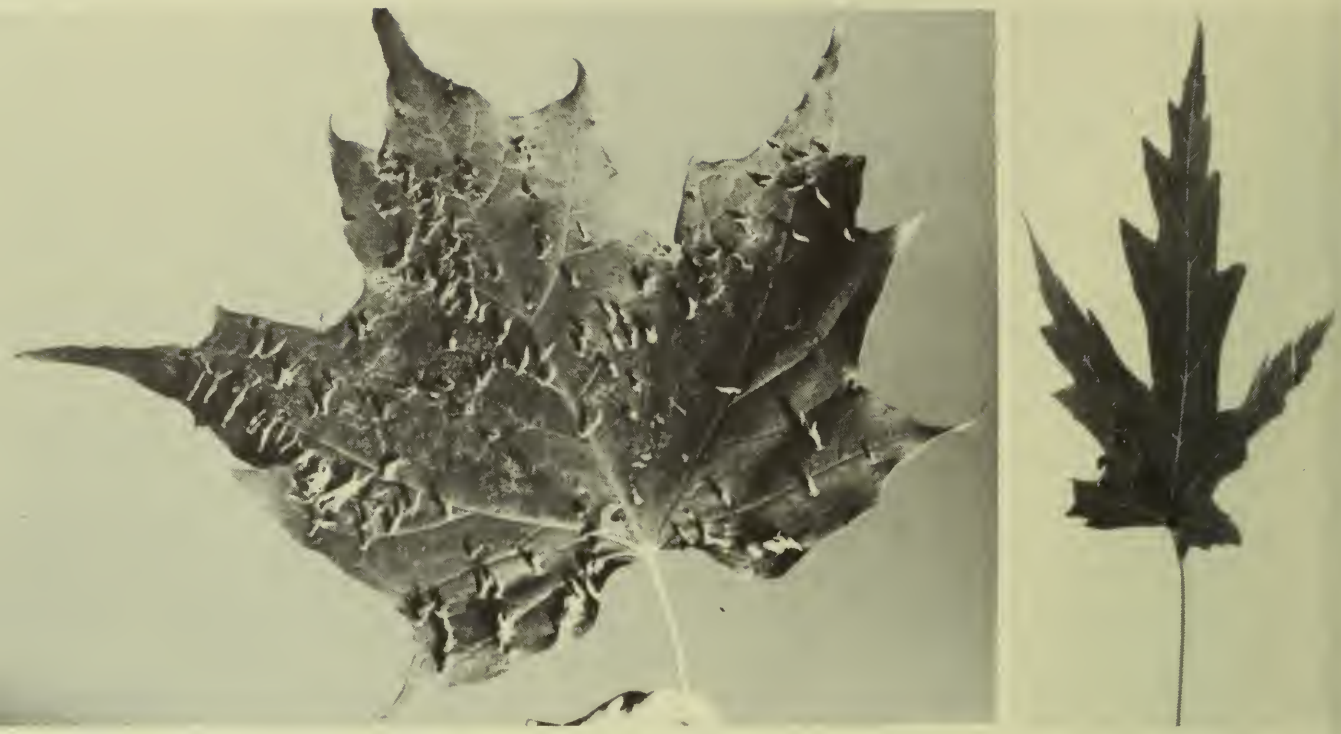

Two different maple bladdergalls found in Canada.

the gall to protected sites around the buds and in the bark, where they remain until the following spring.

Members of several species of eriophyoid mites in the genera *Aceria* and *Aculus* cause bright purple or reddish felt-like patches, called erinea, on the underside of maple leaves. These mites have life cycles similar to that of the gall mites described above, but form colonies within the fibres of the erineum rather than in enclosed galls.

DAMAGE

Gall mites, even when numerous, will not kill a tree but the galls can spoil the appearance of an ornamental tree and retard its development. A severe bladder gall mite infestation on a young maple tree can, therefore, have undesirable consequences.

CONTROL

Mites overwinter in protected parts of the tree or crevices in the bark. The best time to get rid of them is in the spring before they move to the new foliage. One of the following sprays can be used effectively when the buds are turning green:

- Commercial lime-sulphur or dormant oil can be applied in early spring, before the leaves unfold. If good coverage is obtained, one spray should be sufficient. These can also be used in the late fall after the leaves have dropped.
- Malathion or carbaryl (Sevin ^{R}). One application of a 2% solution of either insecticide when the buds are turning green, followed by a second application 2 weeks later.

- Miticides or acaricides such as Dicofol (Kelthane ^{R}). These may not be readily available in certain parts of the country.

Most of the damage is done when the galls have formed on the leaves and the mites are inside. Control at this stage is difficult but some measure of success may be obtained with systemic insecticides. In liquid form, dimethoate can be used as a foliage spray or it can be "painted" on a smooth area of the bark in a band 15 to 20 cm (6 to 8 in.) wide around the tree trunk, below the branches. Thus applied, this systemic insecticide penetrates the bark and is carried throughout the tree by the sap.

CAUTION

When using any of the above-mentioned insecticides and miticides, it is necessary to read the recommendations of the manufacturer and to follow them carefully. Insecticides or miticides must never be placed within the reach of children or pets, or where their containers may be mistaken for other materials.

CONVERSION FACTORS FOR METRIC SYSTEM

Imperial units	Approximate conversion factor	Results in:	
LINEAR			
inch	x 25	millimetre	(mm)
foot	x 30	centimetre	(cm)
yard	x 0.9	metre	(m)
mile	x 1.6	kilometre	(km)
AREA			
square inch	x 6.5	square centimetre	(cm^2)
square foot	x 0.09	square metre	(m^2)
acre	x 0.40	hectare	(ha)
VOLUME			
cubic inch	x 16	cubic centimetre	(cm^3)
cubic foot	x 28	cubic decimetre	(dm^3)
cubic yard	x 0.8	cubic metre	(m^3)
fluid ounce	x 28	millilitre	(mL)
pint	x 0.57	litre	(L)
quart	x 1.1	litre	(L)
gallon	x 4.5	litre	(L)
WEIGHT			
ounce	x 28	gram	(g)
pound	x 0.45	kilogram	(kg)
short ton (2000 lb)	x 0.9	tonne	(t)
TEMPERATURE			
degrees Fahrenheit	(°F-32) x 0.56 or (°F-32) x 5/9	degrees Celsius	(°C)
PRESSURE			
pounds per square inch	x 6.9	kilopascal	(kPa)
POWER			
horsepower	x 746	watt	(W)
	x 0.75	kilowatt	(kW)
SPEED			
feet per second	x 0.30	metres per second	(m/s)
miles per hour	x 1.6	kilometres per hour	(km/h)
AGRICULTURE			
gallons per acre	x 11.23	litres per hectare	(L/ha)
quarts per acre	x 2.8	litres per hectare	(L/ha)
pints per acre	x 1.4	litres per hectare	(L/ha)
fluid ounces per acre	x 70	millilitres per hectare	(mL/ha)
tons per acre	x 2.24	tonnes per hectare	(t/ha)
pounds per acre	x 1.12	kilograms per hectare	(kg/ha)
ounces per acre	x 70	grams per hectare	(g/ha)
plants per acre	x 2.47	plants per hectare	(plants/ha)

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